

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: PETYA PETROVA *ET AL.*

SERIAL NO. 09/856,774

FILED:

INTERNATIONAL APPL. NO.: PCT/EP99/09147

INTERNATIONAL FILING DATE: 11/22/99

FOR: FUNCTIONAL TRIFLUOROVINYL
MONOMERS AND THEIR
COPOLYMERIZATION WITH
FLUOROOLEFINS

ART UNIT: TO BE ASSIGNED

EXAMINER: TO BE ASSIGNED

RECEIVED

OCT 11 2001

TC 1700

Asst. Commissioner for Patents
Washington, D.C. 20231HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST-
CLASS MAIL IN AN ENVELOPE ADDRESSED TO: ASST. COMMISSIONER FOR PATENTS AND TRADEMARKS, WASHINGTON D.C.
20231 ON THIS 31st DAY OF July 2001. BY: Candice A. McPhersonSUBMISSION OF PRELIMINARY EXAMINATION REPORT

Sir:

Enclosed with this paper is a copy of the International Preliminary Examination Report
(PCT/EP99/09147).No additional fee is due. If there are any additional fees due in connection with the filing
of this response, including any fees required for an additional extension of time under 37 CFR 1.136,
such an extension is requested and the Commissioner is authorized to
charge or credit any overpayment to Deposit Account No. 03-2775.

Respectfully submitted,

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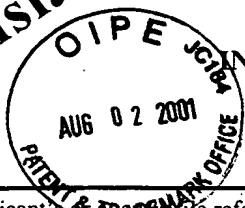
Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



Applicant's reference S98_35	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP99/09147	International filing date (day/month/year) 22 November 1999 (22.11.99)	Priority date (day/month/year) 25 November 1998 (25.11.98)
International Patent Classification (IPC) or national classification and IPC C07C 33/42		RECEIVED OCT 11 2001
Applicant SOLVAY (SOCIETE ANONYME) TC 1700		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 23 June 2000 (23.06.00)	Date of completion of this report 26 February 2001 (26.02.2001)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP99/09147

I. Basis of the report

1. This report has been drawn on the basis of (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.):

- ☐ the international application as originally filed.
- ☒ the description, pages 1-21, as originally filed,
pages _____, filed with the demand,
pages _____, filed with the letter of _____,
pages _____, filed with the letter of _____.
- ☒ the claims, Nos. _____, as originally filed,
Nos. _____, as amended under Article 19,
Nos. _____, filed with the demand,
Nos. 1-16, filed with the letter of 06 November 2000 (06.11.2000),
Nos. _____, filed with the letter of _____.
- ☐ the drawings, sheets/fig _____, as originally filed,
sheets/fig _____, filed with the demand,
sheets/fig _____, filed with the letter of _____,
sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

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International application No.
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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-16	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	7-10, 14	NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims		NO

2. Citations and explanations

D2: US-A-5 514 717, cited in the application.

D3: EP-A-0 138 091, cited in the application.

D4: EP-A-0 135 917, cited in the application.

D6: Y. TADA et al., DIE MAKROMOLEKULARE CHEMIE, 194(8), 1993, pages 2163-2171

D7: D. SU et al., J. of Am. Chem. Soc., 112(8), 1990, pages 3152-3155.

In response to the objection relating to novelty raised in the written opinion, the applicant has amended the set of claims by inserting two provisos ($m = 1$ or 2 , $W =$ phosphanate and $m = 2$, $Y = O$, $Z = COCH_3$) on the basis of D2, D6 and D7, by deleting Claims 5, 9 and 13 and by adding a new Claim 8. All these amendments are supported by the original set of claims and are therefore admissible (PCT Article 34(2)(b)).

1. Novelty - PCT Article 33(2)

The following fluorinated monomers of formula (I) known from the prior art have been excluded from Claim 1:

- D2 (example 18, lines 66-67; di-^tBu 2,3,3-trifluoro-2-propenylphosphonate, column 14).

- D6 (compound 1, scheme 2, page 2167)
- D7 (compounds (9) and (10)).

The subject matter of said claim can therefore be considered novel in the light of the above-mentioned documents.

The copolymerisation of fluorinated monomers ($Y = O$, $Z = H$ or $W' = \text{epoxy}$) with a fluorinated olefin of formula (III) and/or an olefin compound is disclosed in the prior art:

- D3 (page 1, lines 10-15; Example 1, page 4, usable in Example 5, page 10; olefin compound: propylene (page 1, line 28)).
- D4 (page 2, lines 25-38; page 4, lines 25-27; Examples 5-6, page 10, and Example 3, page 13).

The subject matter of Claims 4 and 11 and the claims dependent thereon can therefore be considered to be novel. The subject matter of Claims 7 and 14 corresponds to a selection over D3 and, as such, the novelty thereof can be recognised.

The incorporation of the copolymerisation step (Claims 15-16) in cross-linking methods and the production of fluorinated elastomers (Claim 10) can therefore also be considered to be novel.

2. Inventive step - PCT Article 33(3)

2.1 The copolymerisation method of D4 (example 5, Table 1, page 10) differs from that of the present application in terms of the nature of (I'): $Y = O$, $Z = H$, which solution is excluded from the application. The technical problem was that of identifying other monomers copolymerisable with fluorinated olefins. The solution proposed by the

applicant is the method of Claim 4. As shown in Example 7 (pages 16-18), the compounds (I') provide solutions to the stated problem. This alternative cannot be derived in an obvious manner from the teaching of D4. An inventive step can therefore be recognised for the subject matter of Claims 4 and 11. Compounds (I) have a common structural unit with compounds (I'), which unit confers inventiveness to the application. Therefore, the subject matter of Claim 1 is considered to involve an inventive step.

2.2 The subject matter of Claims 7 and 11 is directed to the selection of $\text{CF}_2=\text{CF}(\text{CF}_2)_m(\text{CH}_2)_n\text{OH}$ from D3, such that $m = 0$ and $n = 1-3$, with two co-monomers, vinylidene fluoride or tetrafluoroethylene with ethylene or propylene (page 2, lines 26-33). Such a selection can be considered to be inventive only if the resulting copolymer has unexpected properties relative to those of D3 (page 2, lines 10-15). However, no such property has been indicated in the application. Consequently, the subject matter of Claims 7 and 14 is not considered to involve an inventive step.

2.3 The cross-linking method of D4 uses the trimer of diisocyanate hexamethylene as a cross-linking agent (Examples 14-15, page 14). The technical problem addressed is that of providing a simple cross-linking method that does not require additional steps (cf. page 9, line 24 to page 10, line 2). The prior art does not mention reacting the fluorinated copolymers of formulae (IV) to (IX) with a non-conjugated $\text{C}_5\text{-C}_8$ diene. Moreover, said copolymers can be directly cross-linked, since the cross-linking site, group W' , is already included therein. The subject matter of Claims 15-16 is therefore considered to involve an inventive step.

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VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. For purposes of clarity (PCT Article 6), the generic formula (IV), as well as the definition of the parameters relating thereto, should be inserted in Claim 4.
2. The term 'substituted', used with the aryl group in Claims 1, 4, 7, 11 and 14, is too vague. As the nature of the substituent is not indicated, this means that any theoretically possible substitution is encompassed thereby (PCT Article 6). It will be impossible to ever prove, even with a large number of experimental results, that all these compounds solve the technical problem addressed (PCT Article 33(3)).